

CLAIMS

1. A method for calibrating at least one or more amplifiers (100,200), characterised in:
- 5 i) generating a noise signal (N_a+N_i) produced by said one or more amplifiers (100,200) when no input signal (S_i+N_i) is connected (Alt. 2) to at least one amplifier of said one or more amplifiers (100,200);
- 10 ii) using said noise signal (N_a+N_i) as a calibrating signal for estimating a corresponding gain (G) of said one or more amplifiers (100,200) by measuring (600) at least one output of said one or more amplifiers (100,200) the amount of noise (S_{tot}) of said one or more amplifiers (100,200).
- 15 2. A method for calibrating at least one or more amplifiers (100,200) according to claim 1, characterised in that further is said gain (G) adjusted in accordance with said calibrating signal.
- 20 3. A method for calibrating a receiver (1,2), characterised in:
- 25 i) generating a noise signal (N_a+N_i) produced by one or more amplifiers (100,200) of said receiver when an input signal (S_i+N_i) is disconnected (Alt. 2) to said receiver;
- 30 ii) using said noise signal (N_a+N_i) as a calibrating signal for estimating a corresponding gain (G) of said one or more amplifiers in said receiver by measuring (600) at the output of the receiver the amount of noise (S_{tot}) of said one or more amplifiers (100,200).
- 35 4. A method for calibrating a receiver according to claim 3, characterised in that further is said gain (G) adjusted in accordance with said calibrating signal.

5. A calibration arrangement (1,2) comprising:
one or more amplifiers (100,200) for amplifying a radio
signal (S_i+N_i);
estimating means (600) for estimating a gain (G) of said
one or more amplifiers (100,200);
characterised in that disconnecting said
radio signal (S_i+N_i), while at least one amplifier of
said one or more amplifiers (100,200) is producing a
calibrating signal (N_a+N_i) as a reference signal into
said estimating means (600) for estimating said gain (G)
of said radio signal (S_i+N_i).
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- 10 6. A calibration arrangement (1,2) comprising:
one or more amplifiers (100,200) for amplifying a radio
signal (S_i+N_i);
estimating means (600) for estimating a gain (G) of said
one or more amplifiers (100,200);
characterised in that said calibration
arrangement (1,2) further comprises:
a switching means (10,30+100) for disconnecting said
radio signal (S_i+N_i), while at least one amplifier of
said one or more amplifiers (100,200) is producing a
calibrating signal (N_a+N_i) as a reference signal into
said estimating means (600) for estimating said gain (G)
of said radio signal (S_i+N_i).
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- 15 20 7. A calibration arrangement (1,2) according to any one of
claims 5-6,
characterised in that said calibrating
signal is a pure noise signal (N_a+N_i) of at least one
amplifier of said one or more amplifiers (100,200).
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- 25 30 8. A calibration arrangement (2) according to any one of
claims 5-7,
characterised in that disconnecting said one
or more amplifiers (100,200) from said radio signal
(S_i+N_i) by disconnecting a power supply (500) from at

least one amplifier of said one or more amplifiers (100,200).

9. A calibration arrangement (2) according to any one of claims 6-7,

5 characterised in that said switching means (30+100) is disconnecting said one or more amplifiers (200) from said radio signal (S_i+N_i) by disconnecting a power supply (500) from at least one amplifier of said one or more amplifiers (100,200).

10 10. A calibration arrangement (1) according to any one of claims 5-7,

characterised in that disconnecting said one or more amplifiers (100,200) from said radio signal (S_i+N_i) by connecting at least one input of said one or more amplifiers (100,200) to a reference potential (20).

11. A calibration arrangement (1) according to any one of claims 6-7,

characterised in that said switching means (10) is disconnecting said one or more amplifiers (200) from said radio signal (S_i+N_i) by connecting at least one input of said one or more amplifiers (100,200) to a reference potential (20).

12. A calibration arrangement (1) according to any one of claims 10-11,

25 characterised in that said reference potential is a resistance (20) through ground.

13. A calibration arrangement (1,2) according to any one of claims 5-12,

30 characterised in that the calibration arrangement (1,2) further comprises:
more than one amplifiers (100+200) in a chain for amplifying said received radio signal (S_i+N_i).

14. A calibration arrangement (1,2) according to any one of claims 6-7,
characterised in that said switching means (10,30+100) is disconnecting said one or more amplifiers (100,200) from said radio signal (S_i+N_i) by disconnecting at least one input of said one or more amplifiers (100,200) which is closest to where said radio signal (S_i+N_i) is inputted.
15. A calibration arrangement (1,2) according to any one of claims 5-14,
characterised in that said calibrating signal is a noise power ($kTBF$) from said one or more amplifiers (100,200) that comprises:
a known Boltzman constant (k);
a known bandwith (B) of said noise power;
a known noise figure of said noise power;
a measured temperature (T) of said receiver.
16. A calibration arrangement (1,2) according to any one of claims 5-15,
characterised in that an output from the last one of said one or more amplifiers (100,200) in a chain is connected to an analog-digital-converter (400) for converting analog signals into digital signals.
17. A calibration arrangement (1,2) according to claim 15,
characterised in that said gain (G) of said radio signal (S_i+N_i) is estimated from said calibrating signal (N_a+N_i) including said noise power ($kTBF$) when an output signal (S_{tot}) is measured at least one output of said one or more amplifiers (100,200).
18. A calibration arrangement (1,2) according to any one of claims 5-16,
characterised in that said gain (G) of said radio signal (S_i+N_i) is estimated from said calibrating

signal (N_a+N_i) when an output signal (S_{tot}) is measured at least one output of said one or more amplifiers (100,200).

19. A calibration arrangement (1,2) according to any one of
5 claims 15-16,

characterised in that said gain (G) of said radio signal (S_i+N_i) is estimated from said calibrating signal (N_a+N_i) when an output signal (S_{tot}) is measured after said analog-digital-converter (400).

10 20. A receiver (1,2) comprising:

means (300) for receiving a radio signal (S_i+N_i);
one or more amplifiers (100,200) for amplifying said received radio signal (S_i+N_i);

15 estimating means (600) for estimating a gain (G) of said receiver (12);

characterised in that said receiver further comprises:

20 a switching means (10,100) for disconnecting said received signal (S_i+N_i), while at least one amplifier of said one or more amplifiers (100,200) is producing a calibrating signal (N_a+N_i) as a reference signal into said estimating means (600) for estimating said gain (G) of said radio signal (S_i+N_i).

21. A receiver (1,2) according to claim 20,

25 characterised in that said calibrating signal is a pure noise signal (N_a+N_i) of at least one amplifier of said one or more amplifiers (100,200).

22. A receiver (1) according to any one of claims 20-21,

30 characterised in that said switching means (10) is disconnecting said radio signal (S_i+N_i) by connecting at least one input of said one or more amplifiers (100) to a reference potential (20).

23. A receiver (1) according to claim 22,
characterised in that said reference
potential is a resistance (20) through ground.
24. A receiver (2) according to any one of claims 20-21,
5 characterised in that said switching means
(100) is disconnecting said one or more amplifiers
(100,200) from said radio signal (S_i+N_i) by disconnecting
a power supply (500) from at least one amplifier of said
one or more amplifiers (100,200).
- 10 25. A receiver (1,2) according to any one of claims 20-24,
characterised in that the receiver (1,2)
further comprises:
more than one amplifiers (100+200) in a chain for
amplifying said received radio signal (S_i+N_i).
- 15 26. A receiver (1,2) according to any one of claims 20-25,
characterised in that said calibrating
signal is a noise power (kTBF) from said one or more
amplifiers (100,200) that comprises:
a known Boltzman constant (k);
20 a known bandwith (B) of said noise power;
a known noise figure of said noise power;
a measured temperature (T) of said receiver.
- 25 27. A receiver (1,2) according to any one of claims 20-26,
characterised in that an output from the
last one of said one or more amplifiers (200) in a chain
is connected to an analog-digital-converter (400) for
converting analog signals into digital signals.
- 30 28. A receiver (1,2) according to claim 26,
characterised in that said gain (G) of said
received radio signal (S_i+N_i) is estimated from said
calibrating signal (N_a+N_i) including said noise power
(kTBF) when an output signal (S_{tot}) is measured at least
one output of said one or more amplifiers (100,200).

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29. A receiver (1,2) according to any one of claims 20-27, characterised in that said gain (G) of said received radio signal (S_i+N_i) is estimated from said calibrating signal (N_a+N_i) when an output signal (S_{tot}) is measured at least one output of said one or more amplifiers (100,200).
30. A receiver (1,2) according to any one of claims 20-27, characterised in that said gain (G) of said received radio signal (S_i+N_i) is estimated from said calibrating signal (N_a+N_i) when an output signal (S_{tot}) is measured after said analog-digital-converter (400).